

ANSWERS TO CONTINUING MEDICAL EDUCATION QUESTIONS

Clinical microbiological case: esophago-airway fistula in an AIDS patient

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Please refer to the article on page 183 of this issue to view the questions to which these answers refer.

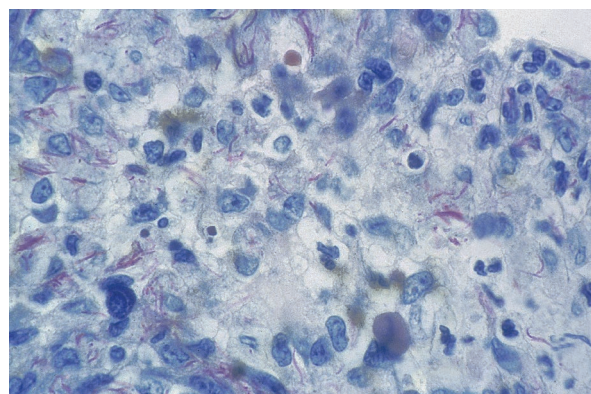


Figure 1 Tissue acid-fast stain of the esophageal biopsy.

ANSWERS

1. Esophago-airway fistulas occur rarely in patients with AIDS despite the frequent occurrence of pulmonary and esophageal infections [1]. The few reported cases have occurred with infections caused by *Mycobacterium tuberculosis*, *Mycobacterium avium-intracellulare*, *Candida albicans*, *Nocardia* species, cytomegalovirus and herpes simplex virus [2–9]. The incidence of the above infections is inversely related to the level of cell-mediated immunity.
2. Figure 1 shows numerous acid-fast bacilli in the tissue with a histiocytic host cell response. Some of the bacilli are quite elongated, suggesting that perhaps these are atypical mycobacteria. The identity of the acid-fast bacilli in the biopsy was unknown since a culture was not obtained of the specimen. Because the therapy differs greatly depending upon the species of mycobacteria other attempts at speciation were undertaken. Blood cultures for acid-fast micro-organisms were obtained as well as washings from the esophageal ulcer. The blood cultures yielded *M. avium-intracellulare*. The esophageal washings yielded *M. avium-intracellulare* and *Mycobacterium kansasii*. Formalin-fixed, paraffin-embedded tissue sections of the esophageal biopsy were tested for DNA amplification. Nucleic acid was extracted from the tissue sections and individual DNA amplifications were performed and probed for the detection of *Mycobacterium* [10,11]. For control purposes human DNA and mycobacterial DNA were assayed and detected before probing for four species of *Mycobacterium* (*M. avium*, *M. tuberculosis*, *M. kansasii* and *M. gordonae*). The only *Mycobacterium* detected in the tissue sections from the esophageal ulcer was *M. kansasii*. (However, the *M. avium* probe is the least effective of the four probes and it is possible that *M. avium* could be present also.)
3. Although the patient refused any therapy a suitable regimen for the *M. avium-intracellulare* would include a macrolide, preferably clarithromycin (azithromycin is also effective) and ethambutol. A third agent, such as rifabutin or amikacin may be added to this regimen. Therapy for *M. kansasii* would include ethambutol, rifampin and isoniazid.
4. Implementation of Highly Active AntiRetroviral Therapy (HAART) could possibly benefit this patient by restoring the CD4 cell count and reducing HIV-1 viremia.

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DISCUSSION

Esophageal infection occurs commonly in AIDS patients and esophageal candidiasis may be the initial manifestation of immune dysfunction [12]. Although *Candida albicans* is the most common cause of esophagitis, mycobacterial esophagitis

may be increasing in the AIDS population [9,13]. Common complications of esophagitis in these patients include ulceration, perforation, fistula formation, hemorrhage and stricture [6]. However, esophageal inflammation is generally limited to the mucosal surface, and transmural involvement is rare [14]. There are several case reports of esophago-airway fistulas in AIDS patients with *M. tuberculosis* and *M. avium-intracellulare*. No cases of esophago-airway fistula associated with *M. kansasii* have been reported.

The patient reported here had disseminated *M. avium-intracellulare* infection (demonstrated by culture of the micro-organism from the blood) which is a frequent opportunistic infection in AIDS patients with profoundly depressed numbers of CD4 cells (usually <50 cells/ μ L) [13]. Disease is frequently found in the gastrointestinal tract although any organ can be involved. Disease with *M. kansasii* in AIDS patients most often presents late in the course of the viral disease when CD4 cell counts are <50 cells/mL, and it is usually confined to the lung [15]. However, it is noteworthy that *M. kansasii* has been considered the most virulent of the non-tuberculous mycobacteria [14]. In the non-immunosuppressed population *M. kansasii* causes a pulmonary infection that is clinically indistinguishable from tuberculosis and culture evidence of the micro-organism is often a sign of invasive disease. It has been suggested that the presence of mucosal thrush due to *Candida* may increase the susceptibility of the mucosa to superinfection with swallowed mycobacteria [3]. It is noteworthy that the patient reported here had extensive oral thrush and was treated for presumed esophageal thrush.

Our experience with this patient and review of the literature suggest that esophago-airway fistula may be common in cases of AIDS with extremely low CD4 cell counts (<50 cells/mL), and that culture for mycobacteria should be performed on all esophageal biopsies as the therapy for the different *Mycobacteria* species is quite different.

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